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**(54) CONTROLLING METHOD FOR INTERNAL COMBUSTION ENGINE**

**(57) Abstract:**

**PROBLEM TO BE SOLVED:** To remove nitrate and sulfate adsorbed to a nitrogen oxide storage reduction catalyst by returning an excess air rate to an original rate after operated at a certain time, setting the excess air rate to a specific value.

**SOLUTION:** When an excess air rate is in a lean burn state, an oxygen ion O<sub>2</sub><sup>-</sup> or O<sub>3</sub><sup>-</sup> and NO<sub>x</sub> are reacted to generate a nitrate ion NO<sub>3</sub><sup>-</sup>, the nitrate ion NO<sub>3</sub><sup>-</sup> is adsorbed to a surface of a catalyst 1 thereby forming a nitrate. The nitrate on the catalyst 1 is in a saturated state, the excess air rate is made slightly smaller than  $\lambda=1.0$ , and an internal combustion engine is operated in a rich state for five to six minutes whereby the nitrate is reacted with an unburned HC and CO contained in an exhaust gas. Accordingly, the nitrate on the catalyst 1 is decomposed into an N<sub>2</sub>, CO<sub>2</sub> and H<sub>2</sub>O and reduced thereby to be removed. After conduction of rich spike, the excess air ratio is set again to be in the lean state ( $\lambda=1.5$ ). Accordingly, NO<sub>x</sub> in the

exhaust gas is reduced by the nitrogen oxide storage reduction catalyst to reduce the amount of NO<sub>x</sub> discharged to the atmosphere.

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